FIRST HIGH RESOLUTION IR SPECTRA OF 2-^{13}C-PROPANE. THE ν_9 B-TYPE BAND NEAR 366.767 cm^{-1}AND THE ν_{26} C-TYPE BAND NEAR 746.615 cm^{-1}. DETERMINATION OF GROUND AND UPPER STATE CONSTANTS.

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This is the first report in a project to record high resolution IR data of the ^{13}C and D substituted isotopologues of propane.

In this talk we will give details on the first high resolution ($\Delta\nu$ = 0.0009 cm^{-1}) IR investigation of 2-^{13}C-propane. Spectra of the CCC skeletal bending mode near 336.767 cm^{-1}(B-type) and the wagging mode near 746.615 cm^{-1}(C-type) were recorded using the FTS on the Far-IR beamline of the Canadian Light Source (CLS). The spectra were assigned both traditionally and with the aid of the PGOPHER program of Colin Western.[a] The only available MW data on this molecule are the six K =0 J lines from Lide.[b] We therefore had to use the present data to determine a new set of ground state constants that included centrifugal distortion terms for this molecule. We compare these experimentally determined values with the recent *ab initio* values of Villa, Senent & Carvajal.[c] Upper state constants for both bands have been found that provide a good simulation of the spectra. The hope is that this data will be useful in identifying isotopic propane lines in Titan and other astrophysical objects.

[a] C. Western, J. Quant. Spectrosc. & Rad. Transf. **186**, 221 ff. (2017).

[b] Lide, J.Chem. Phys. **33**, p.1514ff. (1960).

[c] Villa, Senent & Carvajal, PCCP **15**, 10258 (2013).